1090-WP-16-03
10 December 2002

RTCA Special Committee 186, Working Group 3

ADS-B 1090 MOPS, Revision A

Meeting #16

Title: # Comments of EUROCAE WG51SG1 on Draft DO-260A

Presented by: EUROCAE WG51SG1

Issue: 1.0

Date:: 02.12.2002

1. Foreword

As the draft of DO-260A changed three times in two months from draft 3 to draft 4, to draft 5, then 5 updated while SG1 reviewed it, the SG1 comments may probably not be in line with the latest Draft of DO-260A.

Due to the document volume and the short time available for the review by WG51 SG1, the comments are not exhaustive, especially concerning the aircraft capability to provide the required parameters and their performances. This analysis will be done later in the agreed top down fashion. The provision of the comments is intended to help SC-186 identifying any potential shortcomings or deficiencies. It does not represent a formal approval of DO-260A by WG51 SG1.

The following syntax is used in the Page/paragraph column to express the location:

p nn paragraph number in section

l nn line within the paragraph

2. General Comments

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
G1.	general	This MOPS is not compliant with the ICAO Annex 10, Vol. III, Ch 5 Amdt 77 in force from 28/11/02. Could Airworthiness authorities accept to certify an aircraft compliant with DO-260A i.e. not compliant with ICAO Annex? The MASPS and MOPS propose a solution in order to ensure backwards compatibly. A Version Number has been added in Aircraft Operational Status message (bits 41 to 43 which are reserved in the ICAO standard). DO-260A compliant receivers will recognize the messages received from DO-260 compliant aircraft, decode them and assemble them in the Reports. I do not think that it totally solves the backward compatibility problem: the DO-260 (and ICAO) compliant receivers do not decode the Version Number sent by a DO-260A compliant aircraft and there is a risk they mis-decode some messages. Example of problem The MASPS says in 2.1.2.12: *It is recommended that the coded representations of NIC should be such that:* *a. Equipment that conforms to the current version of this MASPS („version 1“ equipment) will recognize the equivalent NUCP codes from the first edition of this MASPS, and* *b. Equipment that conforms to the initial, DO-242, edition of this MASPS („version 0“ equipment) will treat the coded representations of NIC coming from version 1 equipment as if*	This comment concerns first the DO-242A MASPS and subsequently the DO-260A MOPS.		PG1	

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
		they were the corresponding „NUCP" values from the initial, DO-242, version of this MASPS. I do not think that this recommendation was perfectly followed. Ex: Message Type 6 means: · DO-260: HPL<25 m and HFOM<10m. The probability associated to HPL is 10-7/FH. · DO-260A: HPL<75m (it could be 25 m according to the NIC Supplement Subfield in Aircraft Operational Status Message). HFOM is also in the Aircraft Operational Status Message. The probability associated to the HPL is given by the SIL in Aircraft Operational Status Message. As a consequence a DO-260 (and ICAO) receiver will believe that the HPL is 25 m with a probability of 10-7/FH while it could be 75 m with a probability of 10-3/FH.				
G2.	general	Some requirements seem too much stringent. It is difficult to understand why timing and latency constraints are the same for surveillance than for the guidance of the own aircraft (example: 2.2.3.2.3.7.2 and 2.2.3.2.3.7.3 Extrapolation/Estimation (Precision case or non-precision cases). In fact the most stringent requirement should be put on the latency difference between latitude and longitude (because on some routes it can produce a cross-track error). Then, a less stringent requirement can be put on the common latency because a latency of 1 s gives a position that is on the aircraft trajectory and 1 s behind. Today the SSR provides 4 s, or 8 s or sometimes 12 s.	This comment is relative to the ICAO SARPS because they content exactly the same requirement.		PG2	

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
G3.	general	The HPL and VPL data are rarely available within the avionics of existing aircraft. This is why the MOPS refer to the GPS (or GBAS or SBAS) which provides them associated to the horizontal position and the height. The problem is that GPS is not the normal position source on-board an aircraft. If used alone, its availability and continuity capabilities do not meet the airworthiness requirements. On large airplanes, the FMS uses multiple sensors and output a position compliant with the airworthiness requirement. It is demonstrated during the certification that, during each flight phase, the integrity (including the level of the errors), continuity and availability comply with the airworthiness requirements of this phase. There is no real-time data conveying these values. If GPS is chosen in order to get the HPL/VPL, the risk is that the continuity or availability are not sufficient. Note: GBAS do not provide a HPL but a LPL (Lateral Protection Level). There is no information concerning the longitudinal error.	This comment is relative to the ICAO SARPS.		PG3	
G4.	general	It seems that the manufacturer has the choice to transmit or not the different data (if the data is not provided, a status bit is set to 0). I cannot understand how it will be possible to based ASAS applications on a so vague standards: the authority responsible of the Airspace will have no means to qualify the minimum aircraft capability required to operate a given ASAS application. A MOPS (Minimum…) is a means used by the Airworthiness authorities to check that an aircraft has the minimum capabilities ensuring safety and interoperability.	This comment is true for the ICAO SARPS but more specially for a MOPS.		PG4	

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
G5.	N/A	There is no Time to Alert requirement. The integrity requirement is composed of 3 figures: Protection Limit, Probability and Time to Alert. There is a risk that a Time to Alert requirement appears to be necessary during the OHA process. TTA values could be associated to the NIC or SIL values.	This comment is relative to the ICAO SARPS.		PG5	
G6.	N/A	There is no Continuity requirement. There is a risk that a Continuity requirement appears to be necessary during the OHA process (when a maneuver is initiated the data are available and there is a loss of continuity during the maneuver). Continuity values could be associated to the NIC or NAC values.	This comment is relative to the ICAO SARPS.		PG6	
G7.	general	The role of a MOPS dealing with air-ground or air-air data exchanges is not to provide the requirements because, in order to achieve interoperability, it is necessary to precisely standardize at the ICAO level all the protocols, formats... For such products, the main role of MOPS is to define the boundaries of the function, the performances in environmental conditions, installation and mainly the testing procedures. As a consequence, the sections 2.2.3.2 and 2.2.3.2 should be significantly reduced. The added value relative to the ICAO SARPS is poor (and there is a risk of inconsistency). See for instance sections on the position extrapolation (starting from 2.2.3.2.3.7.2).			PG7	

3. Particular Comments

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
P1.	general	DO-260 uses terms 'these MOPS' or 'this MOPS'.	should be harmonized	minor	PR44	
P2.	general	Why do not include the DAP's from the Mode S enhanced surveillance in the ADS-B data.	Proposal to include the existing BDS dedicated to the DAP's parameters inside the ADS-B message. This will provide then to the non-radar ground stations the same aircraft information data as for radar Enhanced Surveillance.		PP1	
P3.	general	In the light of the recent events the European community thinks that security issues have to be considered also in the ADS-B system. If needed, changes could be introduced in the MASPS and the MOPS.			PP2	
P4.	general	General comment: Appendix A contains lots of 'shalls' and should become part of the main document rather than staying as an Appendix.			PP3	
P5.	general	The word 'must' is used in several places, is it intended that this indicates a requirement? If so wouldn't it be better to use an unambiguous 'shall'.			DS0	
P6.	1.2.1 p1 l1	remark: ADS_B is not a System but a function. This is not in line with the MASPS definition.			CC2	
P7.	1.2.1	remark: The headline mentions ADS-B and TIS-B definitions but the text also contains definitions of aircraft/vehicle as well. Title should be reduced to "Definitions" only			CC3	

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
P8.	2.1.2	The requirement shall be changed to specify that the equipment shall perform its intended function as defined by this MOPS. The second part of the sentence shall be deleted.				
P9.	2.2.3.2.1.2	'short squitter' and 'long squitter' should be renamed by 'acquisition squitter' and 'extended squitter' in the text.			CC1	
P10.	2.2.3.2.1.2, subpara (a) l3	It is probably best to avoid such phrases as 'For the most part….' in a formal specification. Where there are primary or secondary uses for a field then these should be detailed explicitly.			DS1	
P11.	2.2.3.2.1.5 p1 l1	Suggest deleting the words 'ICAO 24-bit' as the table clearly shows that not all addresses are in fact the ICAO 24-bit. The sentence should read: The "AA" field is a 24-bit (bits 9 through 32) field that **shall** contain the Address of the transmitting…..			DS2	
P12.	2.2.3.2.1.5, p1 l2	The phrase '….in the clear' is not understood in this context.			DS3	
P13.	2.2.3.2.1.5, p2 l2/3	Suggest re-wording the following for clarification; From: …. on the value of the DF field, the CF or AF field, if present. To: …….. on the value of the DF field and the CF or AF fields when DF=18 or 19.			DS4	
P14.	2.2.3.2.1.5 first paragraph after the table	It is understood that this paragraph has been added for clarification but the 'shall' is redundant and could be changed to a 'will' with no loss of requirements.			DS5	
P15.	2.2.3.2.1.6 p1 l2	Suggest rewording the text in the bracket as follows: From: (that is, in every message specified in Figure 2.2) To: (that is, in the relevant messages as specified in Figure 2.2) The original text implies that the ME field is present in every message specified in Figure 2.2 which is not the case.			DS7	

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
P16.	2.2.3.2.5.2	This paragraph defines the encoding of the ADS-B emitter category, in accordance with ADS-B MASPS. Yet the second note explains that a specific code assignment should be considered for aircraft operating within the NAS (National Air Space - US Airspace). This should be avoided and an agreement on a single code assignment list should be reached instead. Else this MOPS should provide with requirements to interpret correctly the received ADS-B emitter code as a function of the airspace the emitter is flying in. Without any further justification, this differentiation appears pointless. Why is U.S requesting a different coding than that specified in ICAO documents (Amendment 77)?	Argue the different category encoding different from ICAO. Secondly harmonize the encoding definition for worldwide interoperability	minor	PP12	
P17.	2.2.3.2.7.2	Title in capital # table			PR25	
P18.	2.2.3.2.7.2.3	Title in bold CC - Table A content should be in bold as other tables			PR28	
P19.	2.2.3.2.7.2.4	„OPERATIONAL MODE“ not in capital # of title of following table			PR36	
P20.	2.2.3.2.7.2.4.1	Second sentence „For this version of these MOPS „ of this MOPS			PR37	
P21.	2.2.4.3.1.1	It is not clear in this paragraph if there is intended to be a lower limit on MTL for Equipment Classes A0, A1 and A2 as the lower limit for 15% detect and decode is specified for A3 only in sub-para c.			DS8	
P22.	2.2.5.1.6	Please note that Time mark pulse can not be taken into account by current Mark III transponders (no pin interface). Today, only a Mark IV transponder is capable of providing this function.		major info	PP8	
P23.	2.2.5.1.16, l8 and l13	Replace „§0“ with „§ 2.2.3.2.6.4.9“		Minor	PP18	
P24.	2.2.5.1.17, l8 and l13	Replace „§0“ with „§ 2.2.3.2.6.4.9“		Minor	PP19	

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
P25.	2.2.5.1.20, l6 and l8	Replace „§0“ with „§ 2.2.3.2.6.1.5“		minor	PP20	
P26.	2.2.8.3.1.1 p3 l11	The term ‘mandatory’ is used in this para. Why is this term used. As far as I know there is no National Aviation Authority requirement to ‘mandate’ the ‘four parameters’ in the Target State Report. Should the word ‘must’ replace the word ‘mandatory’?			KH4	
P27.	2.2.8.3.2.1.1 p3 l11	See above (refers to mandated four parameters in the Air Referenced Velocity Report).			KH5	
P28.	2.2.9.1 p4? l1	As above (refers to Notes accompanying Table 2.2.9.1b, Table 2.2.9.1c & Table 2.2.9.1d).			KH6	
P29.	2.4	General question: Is the verification/performance of BDS contents a certification issue (airframer or equipment manufacturers responsibility) ? (Same consideration to be taken for Mode S DAPs).		info: Not really MOPS issue	PP10	
P30.	2.4	Parameters source: Today for enhanced surveillance function and extended squitters, ATSU has been defined as the source number one for BDS filling. However, for ADS-B, ATSU can not be the primary source as time delay is too long for the kind of parameters transmitted for ADS-B. Transponders capable of enhanced surveillance have not a selection source logic that suits ADS-B needs.	For discussion. Not linked to the MOPS	Info: Not really MOPS issue	PP11	
P31.	3.0	Many requirements of this section are dependent on requirements listed in other sections. It is recommended to add cross-references to those paragraphs specifying the related requirements.			CC16	

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
P32.	3.1.3	DO-260A requested 80 NM range, does this range comply with the MASPS application ?	Argue/Harmonize the operational applications requirements (agreed Package 1)	major	PP6	
P33.	3.1.3	§ 3.1.3 states that receivers having a MTL value of –84 dBm are capable of receiving signals at range beyond 80 nm. From table E-1 it is understood that equipment class A3, that shall have a MTL of – 84 dBm shall receive signals at a nominal maximum range of 67 nm. Why this difference?		minor	PP13	
P34.	3.3.3.2	Not only ADS-B transmitters would cause a problem but all 1090 Mhz transmitters would cause a problem. Replace last sentence by "The intent of this requirement is to assure that only one single active 1090 MHz transmitter is active at any time."			CC17	
P35.	3.3.4.6.2 step1 l3	replace « install a ADS-B » with « install an ADS-B »,		Minor	PP15	
P36.	3.3.4.6.2 step1 l4	replace « having a minimum RF power of least 70 watts (i.e., 18.45098040 dBw, or -) » with : « having a minimum RF power of at least 70 watts (i.e. 18.45098040 dBw, or -) How can you justify the number of digits behind the comma ?		Minor	PP16	
P37.	3.3.4.6.2 step1 l4 - l5:	to convert a figure expressed in dBw to dBm you must add 30, not subtract. Hence 18.45098040 dBw equals 48. 45098040 dBm, and 20.96910013 dBw equals 50. 96910013 dBm (as an alternative you can also convert the power from watts to milliwats, take the decimal logarithm and multiply by ten – that is using the definition of dBm).		Minor	PP17	
P38.	3.4.1	Please note that current transponders do not code NAC/NIC/SIL parameters.		info	PP4	

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
P39.	4.2.1.1. p1 l3	Is the term 'Partial Mode Status' defined in the document?			KH1	
P40.	4.4.6 p1 l1	General question: For Mode S Transponders (ED 73A compliant), will squitter transmissions be inhibited when Transponder Control Panel is switched to standby?			KH2	
P41.	4.4.8 p1 l1	General question: By switching the transponder into 'standby' mode will broadcast of barometric altitude be inhibited. If not, how can this paragraph be satisfied.			KH3	
P42.	A.1.4.9.1	TCP transmitted every 1,7 s – is it really necessary ? what is the operational requirement behind this ?		major	PP5	
P43.	A.1.6.2	Note : typo Lat/Lon and/or lat/lon			PR76	
P44.	A.1.7.2	§ d : For lat=+87° , NL=2 Not verify by the formula. You have to explain more the limit conditions			PR78	
P45.	A.2.1	add at end of Note "... or broadcasting incorrect information"			PR81	
P46.	H.4.3	Please note that geometric altitude is not available today on aircraft, except for terrain surveillance, not used for navigation (also refer to separate paper 'Mode S capabilities on Airbus')		info	PP7	
P47.	B.1	SI , II code are not contained in the acronym list and should be added.			CC4	
P48.	B.1 Garble	Garble is the interfering reception of two or more replies.			CC5	
P49.	B.1	Mode S is not listed			CC6	
P50.	B.2	add definition of basic surveillance (e.g. 1.3.1) and enhanced surveillance (e.g. Figure D-1) Please note that the meaning of these Words is different in European Mode S Programmes. (see also Attachment 1 Page 1)			CC7	
P51.	B.2	Should NIC and NAC not be added in the definitions section ?			CC9	

Comment Number	Page / Paragraph	Comment	Proposal / Action	Importance	ref	Status
P52.	B.2	Should Extended Squitter, and acquisition squitter not be added ?			CC10	
P53.	Appendix C	This appendix is only providing high level information and does not seem to add important information to the document.			CC11	
P54.	Appendix E	Headline should be corrected to reflect the actual content of the paragraph "Transmitter and Receiver Power Requirements for **Air-to-Air Range**"			CC12	
P55.	Appendix E	Title of Table E-1 should be revised to read "Air-to-Air Link budget for MTL classes". MTL is one of the parameters like the transmitter power. The row with MTL should be moved to the end of the table.			CC13	
P56.	Appendix E	Since the required MTL levels are the result of the calculations the MTL line should be moved to the end of the table.			CC14	
P57.	Appendix G.4	Europe is preparing DAPs implementations. To assure the compliance with future ADS-B systems we therefore propose to add the DAPs in the Broadcast Mode (BDS 4,0; 5,0; 6,0)			CC15	

Attachment 1

see separate File 'parametres ELS_EHS_Ext Sq 515.2168.01 issue4.doc'

Mode S capabilities on Airbus

- **1- Basic Surveillance:(2001)**
  - **mode S address (24 bits), flight number (FMS), altitude reporting (25 ft) ADC**
  - **flight status, capability report**

2- Elementary Surveillance: 2003

+ SI Code + RA report (Acas)

3- Enhanced Surveillance: (2003)

Data	429 Label	A320/A340	A300/A310	FFCC	B2/B4 w/o GNLU	B2/B4 with GNLU
Selected Altitude (CAP/SAP)	102	FCU	FCU	FCU (TBC)	-	-
Baro corrected alt. (CAP/SAP	204	ADIRU (ADR bus)	DADC	HADC	HADC	HADC
Mach No. (CAP)	205	ADIRU (ADR bus)	DADC	HADC	HADC	HADC
Indicated Airspeed (CAP)	206	ADIRU (ADR bus)	DADC	HADC	HADC	HADC
Magnetic Heading (CAP)	320	ADIRU (IR bus)	IRU	AHRS	-	GNLU
True Airspeed (SAP)	210	ADIRU (ADR bus)	DADC	HADC	HADC	HADC
Baro. Altitude Rate (SAP)	212	ADIRU (ADR bus)	DADC	HADC	HADC	HADC
Ground Speed (SAP)	312	ADIRU (IR bus)	IRU	AHRS	-	GNLU
True Track Angle (SAP)	313	ADIRU (IR bus)	IRU	-	-	GNLU
Roll Angle (SAP)	325	ADIRU (IR bus)	IRU	AHRS	-	GNLU
Track Angle Rate (SAP)	335	ADIRU (IR bus)	IRU	AHRS	-	-
Inertial Vertical Velocity (SAP	365	ADIRU (IR bus)	IRU	AHRS	-	-

4- 1090 Long Squitters: (2003)

- Position, velocity, Ident, Mode S adress, NUC (computed from HIL VIL, HFOM, VFOM),

---> first parameters & definition from old DO260.

---> Need for future update in accordance with DO260A.

ELEMENTARY SURVEILLANCE

BDS	REGISTER FIELD	LABEL (OCTAL)	PARAMETER DESCRIPTION	INPUT DATA SOURCE				
				PRIORITY 1	PRIORITY 2	PRIORITY 3	PRIORITY 4	PRIORITY 5
BDS 1.0 DATA LINK CAPABILITY REPORT	**N/A**	**N/A**						
BDS 1.7 COMMON USAGE GICB CAPABILITY REPORT	**N/A**	**N/A**						
BDS 1.8 MODE S SPECIFIC SERVICES CAPABILITY REPORT	**N/A**	**N/A**						
BDS 1.9 MODE S SPECIFIC SERVICES CAPABILITY REPORT	**N/A**	**N/A**						
BDS 2.0 A/C IDENTIFICATION	**CHARACTERS 1-8**	**233**	Flight identification Word 1	ATC CONTROL BOX (see nota 5)	FMS	ATSU	CMC/ CFDIU	
		234	Flight identification Word 2					
		235	Flight identification Word 3					
		236	Flight identification Word 4					
	CHARACTERS 9-10	**237**	Fligth identification Word 4					
	CHARACTERS 1-8	**301**	Aircraft identification Word 1					CMC/ CFDIU
		302	Aircraft identification Word 2					
		303	Aircraft identification Word 3					
BDS 3.0 TCAS Active resolution advisory		N/A						

	BDS	REGISTER FIELD	LABEL (OCTAL)	PARAMETER DESCRIPTION	P 1	P 2
ENHANCED SURVEILLANCE	BDS 4.0 SELECTED VERTICAL INTENTION	MCP/FCU Selected altitude	102	Selected altitude	FCU	
			025	Selected altitude	N/A	
		FMS selected altitude	102	Selected altitude	N/A	
		Barometric pressure setting	234	Baro correction	ADC	
		Status of MCP/FCU mode bits	N/A			
		Vertical navigation mode	N/A			
		Altitude hold mode	N/A			
		Approach mode	N/A			
		Status of target alt source bits	N/A			
		Target altitude source	N/A			
	BDS 5.0 TRACK & TURN REPORT	ROLL ANGLE	325	Roll angle	IRS	
		TRUE TRACK ANGLE	103	GNSS track angle	GPS	
			313	True track angle		IRS
			013	True track angle (BCD)	N/A	
		GROUND SPEED	112	GNSS ground speed	GPS	
			312	Ground speed		IRS
			012	Ground speed (BCD)	N/A	
		TRACK ANGLE RATE	335	Track angle rate	IRS	
		TRUE AIRSPEED	210	True airspeed (BNR)	ADC	
			230	True airspeed (BCD)	N/A	
	BDS 6.0 HEADING &SPEED REPORT	MAGNETIC HEADING	320	Magnetic heading (BNR)	IRS	
			014	Magnetic heading (BCD)	N/A	
		INDICATED AIRSPEED	206	Computed airspeed	ADC	
		MACH	205	Mach	ADC	
		BARO ALT RATE	212	Altitude rate barometric	ADC	
		INERTIAL VERTICAL VELOCITY	365	Inertial vertical velocity	IRS	

EXTENDED SQUITTER	**BDS 0.5** **AIRBONE POSITION**	**TYPE**	**130**	Horizontal integrity limit	GPS			
			247	Horizontal figure of merit	GPS			
			167	Estimated position uncertainty	N/A			
			136	Vertical figure of merit	N/A			
		SURVEILLANCE STATUS	**N/A**					
		SINGLE ANTENNA FLAG	**N/A**					
		ALTITUDE	**370**	GNSS height	N/A			
			203	Altitude barometric	ADC			
		ENCODED LATITUDE	**110**	GNSS latitude	GPS			
			310	Latitude present position		IRS	FMS	
			010	Latitude present position (BCD)	N/A			
			120	GNSS latitude fine	GPS			
		ENCODED LONGITUDE	**111**	GNSS longitude	GPS			
			311	Longitude present position		IRS	FMS	
			011	Longitude present position (BCD)	N/A			
			121	GNSS longitude fine	GPS			
		CPR FORMAT	**N/A**					
		TIME	**150**	UTC	GPS			
		ENCODED LATITUDE/LONGITUDE	**103**	GNSS track angle	GPS			
			313	True track angle		IRS		
			013	True track angle (BCD)	N/A			
			112	GNSS ground speed	GPS			
			312	Ground speed		IRS		
			012	Ground speed (BCD)	N/A			
			166	GNSS N/E velocity	GPS			
			366	N/S velocity		IRS		
			174	GNSS E/W velocity	GPS			
			367	E/W velocity		IRS		
			210	True airspeed			ADC	
			206	Computed airspeed				ADC

EXTENDED SQUITTERS (Cont'd)	**BDS 0.6** **SURFACE POSITION**	**TYPE**	**130**	Autonomous horizontal integrity limit	GPS			
			247	Autonomous figure of merit	GPS			
			136	Vertical figure of merit	N/A			
			167	Estimated position uncertainty	N/A			
		MOVEMENT	**112**	GNSS ground speed	GPS			
			312	Ground speed		IRS		
			012	Ground speed (BCD)	N/A			
		GROUND TRACK	**103**	GNSS track angle	GPS			
			313	True track angle		IRS		
			013	True track angle (BCD)	N/A			
		ENCODED LATITUDE	**110**	GNSS latitude	GPS			
			310	Latitude present position		IRS	FMS	
			010	Latitude present position (BCD)	N/A			
			120	GNSS latitude fine	GPS			
		ENCODED LONGITUDE	**111**	GNSS longitude	GPS			
			311	Longitude present position		IRS	FMS	
			011	Longitude present position (BCD)	N/A			
			121	GNSS longitude fine	GPS			
		CPR FORMAT	**N/A**	N/A				
		TIME	**150**	UTC	GPS			
		ENCODED LAT/LONG	**103**	GNSS track angle	GPS			
			313	True track angle		IRS		
			013	True track angle (BCD)	N/A			
			112	GNSS ground speed	GPS			
			312	Ground speed		IRS		
			012	Ground speed (BCD)	N/A			
			166	GNSS N/E velocity	GPS			
			366	N/S velocity		IRS		
			174	GNSS E/W velocity	GPS			
			367	E/W velocity		IRS		
			210	True airspeed			ADC	
			206	Computed airspeed				ADC

EXTENDED SQUITTER (Cont'd)	**BDS 0.7** **STATUS**	**TRANSMISSION RATE TYPE SUBFIELD**	**N/A**	N/A		
			370	GNSS height	N/A	
			203	Altitude barometric	ADC	

EXTENDED SQUITTER (Cont'd)	**BDS 0.8** **A/C IDENT & CATEGORY**	**CHARACTER 1-8**	**233**	Flight identification Word 1	ATC CONTROL BOX (see nota 5)	FMS	ATSU	CMC/ CFDIU	
			234	Flight identification Word 2					
			235	Flight identification Word 3					
			236	Flight identification Word 4					
		CHARACTER 9-10	**237**	Flight identification Word 5					
		CHARACTER 1 –8	**301**	A/C identification word 1					CMC CFDIU
			302	A/C identification word 2					
			303	A/C identification word 3					
		CHARACTER 1-8	**360**	Flight number character 1-8	N/A				
		AIRCRAFT CATEGORY	**TBD**						
		(*) control panel with priority 1 is compliant with ARINC718A but could only be used on Airbus WB aircraft with a specific modification installed.							

EXTENDED SQUITTER (Cont'd)	**BDS 0.9 AIRBONE VELOCITY SUBTYPE 1 AND 2**	**SUBTYPE**	**N/A**				
		NUC	**N/A**				
		E/W VELOCITY	**174**	GNSS E/W velocity	GPS		
			367	E/W velocity		IRS	
		N/S VELOCITY	**166**	GNSS N/S velocity	GPS		
			366	N/S velocity		IRS	
		VERTICAL RATE	**165**	GNSS vertical velocity	GPS		
			365	Inertial vertical velocity		IRS	
			212	Altitude rate barometric			ADC
			232	Altitude rate	N/A		
		GNSS ALT DIFF FROM BARO ALT	**203**	Altitude barometric	ADC		
			370	Gnss height	N/A		
	BDS 0.9 AIRBONE VELOCITY SUBTYPE 3 AND 4	**SUBTYPE**	**N/A**				
		NUC	**N/A**				
		AIRSPEED	**210**	True airspeed	ADC		
			206	Computed airspeed		ADC	
		VERTICAL RATE	**165**	GNSS vertical velocity	GPS		
			365	Inertial vertical velocity		IRS	
			212	Altitude rate barometric			ADC
			232	Altitude rate	N/A		
		GNSS ALT DIFF FROM BARO ALT	**076**	GNSS alt (MSL)	GPS		
			203	Altitude barometric		ADC	
			370	GNSS height (HAE)	N/A		
		MAGNETIC HEADING	**320**	Magnetic heading	IRS		
			014	Magnetic heading (BCD)	N/A		

EXTENDED SQUITTER (Cont'd)	**BDS 0A** **EVENT DRIVE N POSITION**	**N/A**	**N/A**			

NOTA :

1 - DATA ARE AVAILABLE ON THE FOLLOWING INPUT PORTS :

DATA	BUS	ATC INPUT PORT
GPS	IRS	TP2A/2B
IRS	IRS	TP2A/2B
FMS	FMS	TP6A/6B
ADC	ADC	TP7H/7J or MP5A/5B
ATSU	ATSU	TP2C/2D
FCU	FCU	TP7A/7B or MP3F/3G

2 – If MP6E is open :
on ATC1, ADC1 input bus is active (TP7H/7J)
on ATC2, ADC2 input bus is active (TP7H/7J).

If MP6E is grounded :
on ATC1, ADC3 input bus is active (MP5A/5B)
on ATC2, ADC3 input bus is active (MP5A/5B).

3 – The ATSU has the top priority of all data sources.
Exeptions to this rule are :
. for the flight number labels acquisition which remains has stated above (see BDS 2.0and BDS 0.8),
. the MMR input port (TP 6H/6J), if supported by the transponder, which remains the top priority (if this bus is not available, the GPS labels shall be taken in priority on the IRS bus).

4 – Reference document for BDS definition is SICASP/7-WP/55 except for BDS4.0 which reference document is SCRSP/WGB Flimsy 6 Corrected Final, 02 November 2001.

5 – Control panel with priority 1 is compliant with ARINC 718A but could only be used on Airbus WB A/C with a specific modification installed.